# UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF NEW YORK

CARNEGIE INSTITUTION OF WASHINGTON and M7D CORPORATION,

Plaintiffs,

v.

Case No. 20-cv-189 (JSR)

PURE GROWN DIAMONDS, INC. and IIA TECHNOLOGIES PTE. LTD. d/b/a IIA TECHNOLOGIES,

Defendants.

CARNEGIE INSTITUTION OF WASHINGTON and M7D CORPORATION,

Plaintiffs,

v.

Case No. 20-cv-200 (JSR)

FENIX DIAMONDS, LLC,

Defendant.

# REPLY CLAIM CONSTRUCTION BRIEF OF DEFENDANTS PURE GROWN DIAMONDS, INC. AND HA TECHNOLOGIES PTE. LTD.

#### **GIBBONS P.C.**

William P. Deni, Jr. J. Brugh Lower One Pennsylvania Plaza, 37th Floor New York, NY 10119-3701 Tel: (212) 613-2000

Tel: (212) 613-2000 Fax: (212) 290-2018

# FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP

Anand K. Sharma (pro hac vice) J. Preston Long (pro hac vice) 901 New York Avenue, NW Washington, DC 20001

Tel: (202) 408-4000 Fax: (202) 408-4400

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#### I. INTRODUCTION

Defendants Pure Grown Diamonds, Inc. and IIa Technologies Pte. Ltd. (collectively, the "PGD/2AT Defendants") propose constructions for the disputed claim terms that accord with long-established claim construction cannons and the intrinsic evidence. On the other hand, Plaintiffs' proposals violate Federal Circuit precedent and lack adequate support in—and, at times, even contradict—the intrinsic record. Respectfully, this Court should reject Plaintiffs' proposed constructions and adopt the PGD/2AT Defendants' proposed constructions.

#### II. DISPUTED CLAIM TERMS IN U.S. PATENT NO. 6,858,078

A. "controlling temperature of a growth surface of the diamond such that all temperature gradients across the growth surface are less than 20° C"

Important to the '078 Patent, this claim limitation requires measuring temperature gradients across the growth surface of the diamond and using those measurements to ensure all temperature gradients remain less than 20° C. *See* PGD/2AT Defs.' Br., ECF No. 32, at 5-9. Because the specification characterizes it as essential to maintaining all temperature gradients across the growth surface, Defendants' construction requires, at a minimum, using temperature measurements taken at the middle and an edge of the growth surface.

Plaintiffs appear to suggest this claim limitation can be satisfied even if the temperature is adjusted by a process indifferent to temperature gradients. That is not correct; without an indication of the temperature gradients, they cannot be "controlled." The '078 Patent indicates that feedback of the temperature gradient is essential to adjusting the processing parameters as part of the claimed control process. *See* '078 Patent at 7:5-46, 11:1-42, 12:6-51. Despite citing (often with emphasis) numerous disclosures in the patent that underscore the critical importance of temperature gradient measurements to the "controlling" step, *see* Pls.' Br., ECF No. 31, at

<sup>&</sup>lt;sup>1</sup> Not exclusively, as Plaintiffs incorrectly characterize the PGD/2AT Defendants' proposal.

10-12, Plaintiffs proposal would allow them to argue the claims do not require using any indication of temperature gradients whatsoever. That position ignores the critical importance placed on temperature gradient measurements throughout the '078 Patent, including the claims.

The '078 Patent admits that controlling temperatures was well known, *see* '078 Patent at 6:20-25, and categorically different from controlling *all* temperature *gradients* across the growth surface, as claimed. *See* PGD/2AT Defs.' Br. at 5. The specification thus clarifies any ambiguity: *all* temperature *gradients* across the growth surface, not just a single temperature, are integral to the claimed control step. *See* PGD/2AT Defs.' Br. at 5-7; *see also, e.g., Phillips v. AWH Corp.*, 415 F.3d 1303, 1315-16 (Fed. Cir. 2005) (en banc) ("[I]n case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims." (quoting *Bates v. Coe*, 98 U.S. 31, 38 (1878)).

Plaintiffs' criticisms of Defendants' proposal are unfounded. Contrary to Plaintiffs' arguments, Defendants do not merely replace "controlling" with "using," or read "controlling" out of the claim. *See* Pls.' Br. at 10-11. Defendants clarify the nature of the claimed control. That is, at a minimum, a temperature *gradient* across the surface (i.e., between the middle and an edge of the growth surface) is measured, and using the measured temperature gradient, all temperature *gradients* are maintained within the claimed range. *See* '078 Patent at 7:11-46, 12:16-20. The claim requires using at least one temperature *gradient*, not just a discrete temperature.

Further, Defendants' construction does not exclude using other factors or additional temperature gradient measurements to control the temperature gradients, as Plaintiffs argue. *See* Pls.' Br. at 11-12. It merely sets out a *minimum* requirement, which the patent describes as essential, that "at least" a representative temperature gradient between the middle and an edge of

the growth surface is measured and used to control the temperature gradients. *See* PGD/2AT Defs.' Br. at 6-7. Independent claims 1 and 12 use the open-ended transition phrase, "comprising," meaning that the "control" step may also use additional factors or additional temperatures beyond this minimum. That is entirely within the scope of the claims and Defendants' proposed construction.

Finally, Defendants' construction does not improperly add an ambiguous "maintain[ing]" limitation into the claim. *See id.* at 12. In fact, Plaintiffs themselves use this very language when describing the claim requirements. *See* Compl. ¶ 68 ("The '078 Patent teaches a method for producing MPCVD diamonds using a faster growth rate, moderate pressures within the deposition chamber, and with a particular temperature gradient *to be maintained* during diamond growth." (emphasis added)), ¶ 98 ("Upon information and belief, each of PGD and IIa

Technologies makes the infringing CVD diamonds by a process *requiring maintaining* the growth surface temperature gradient to within 20°C, as recited in independent claims 1 and 12 of the '078 Patent." (emphasis added)). Moreover, "maintaining" is a simple word that any layperson can understand; it does not inject ambiguity into the claims. *See* PGD/2AT Defs.' Br. at 7-8; '078 Patent at 11:53-59, 12:47-51, 12:63-13:3.

Thus, the Court should adopt the Defendants' proposed construction and make clear the "controlling" step cannot occur without using an indication of temperature gradients.

#### B. "growth surface"

"Growth surface" is a simple English phrase. It denotes a surface upon which growth occurs. In the '078 Patent's context, it refers to diamond growth. Claim construction here "involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314. The correct construction, to the extent construction is necessary, is "surface upon which diamond growth is occurring."

Plaintiffs' insistence that a jury cannot grasp this simple phrase without court assistance, yet needs no guidance on other complex, multi-part, disputed claim terms, is paradoxical. *Compare* Pls.' Br. at 15, *with id.* at 8, 12, 16-17. Moreover, their proposal provides uncertainty, not clarity, which is antithetical to the purpose of claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) ("The terms, as construed by the court, must ensure that the jury fully understands the court's claim construction rulings and what the patentee covered by the claims.").

Plaintiffs' position also contradicts established claim construction principles by adding at least three new limitations. *See* PGD/2AT Defs.' Br. at 4. "The construction of claims is simply a way of elaborating the normally terse claim language: in order to understand and explain, but not to change, the scope of the claim." *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1580 (Fed. Cir. 1991). The '078 Patent demonstrates no intention to restrict the claims in the manner Plaintiffs present. Plaintiffs' construction should be rejected in favor of the plain meaning, as Defendants propose.

C. "growing single-crystal diamond... on the growth surface at a growth temperature in a deposition chamber having an atmosphere with a pressure of at least 130 torr" and "growing single-crystal diamond... on the growth surface at a temperature of 900-1400° C"

Defendants' constructions resolves two ambiguities in these complex, multi-part claim limitations. The claims leave unclear (1) whether the claimed "temperature[s]" refer to the temperature of the "growth surface" or some other temperature, such as the temperature of atmosphere in the deposition chamber, and (2) whether the claimed temperature and pressure conditions must be maintained concurrently with the control of temperature gradients on the growth surface. *See* PGD/2AT Defs.' Br. at 14-15. Where the claim language leaves uncertainty, courts turn to the specification to resolve them. *See, e.g.*, *Phillips*, 415 F.3d at 1315-16. Here, the

specification resolves that ambiguity: (1) the claimed temperatures refer to the temperature of the growth surface, and (2) the claimed pressure and temperature conditions are maintained during diamond growth, concurrently with control of the temperature gradients. *See* PGD/2AT Defs.' Br. at 16-17. Plaintiffs improperly sidestep these issues by declining to provide a construction, frustrating the purpose of the claim construction process. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("When the parties present a fundamental dispute regarding the scope of a claim term, it is the court's duty to resolve it.").

Moreover, Plaintiffs' criticisms of Defendants' proposed construction are incorrect. First, Plaintiffs argue that Defendants improperly limit the claim to examples in the specification that involve maintaining growth surface temperature or pressure. Pls.' Br. at 16. Not so. Defendants have merely "elaborate[ed] the normally terse claim language in order to understand and explain, but not to change, the scope of the claim." *Scripps*, 927 F.2d at 1580. The patentee chose to define the claims consistent with, not broader than, the specification. This is understandable in light of the specification's teachings. For example, the specification shows that the inventors only possessed knowledge of growing single-crystal diamond while maintaining the growth surface between 900 °C and 1400 °C, *see* '078 Patent at 14:8-39, tbl. 1, and maintaining an atmospheric pressure of at least 130 torr, *see id.* at 9:50-55. Under these circumstances, Defendants' construction, which includes the "maintain[ing]" language, is appropriate. *See Halliburton Energy Servs. v. M-I LLC*, 514 F.3d 1244, 1253-54 (Fed. Cir. 2008) (adopting a construction to serve the notice function of patent claims).

Second, Plaintiffs argue the word "maintain[ing]" in Defendants' proposal creates ambiguity. Pls.' Br. at 17. This is an odd argument given that Defendants adopt Plaintiffs' own language. See Compl. ¶ 68 ("The '078 Patent teaches a method for producing MPCVD diamonds

using a faster growth rate, moderate pressures within the deposition chamber, and with a particular temperature gradient *to be maintained* during diamond growth." (emphasis added)), ¶ 98 ("Upon information and belief, each of PGD and IIa Technologies makes the infringing CVD diamonds by a process *requiring maintaining* the growth surface temperature gradient to within 20°C, as recited in independent claims 1 and 12 of the '078 Patent." (emphasis added)). The claims themselves also make clear the conditions are maintained while "growing single-crystal diamond." '078 Patent at 15:1-4 15:35-37; *see also id.* at 11:53-59, 12:47-51, 12:63-13:3. And "maintain[ing]" is a simple word any layperson can understand; it does not inject any ambiguity into the claims. Even Plaintiffs' two dictionary definitions—"keeping something 'in an existing state'" and "sustain"— are synonymous. *See* Pls.' Br. at 17.

Lastly, Plaintiffs make an unfounded criticism that Defendants' construction may mislead the jury into believing the diamond must be kept at a single temperature or pressure during its entire growth, or that the growth must be of a type or rate that must maintained. The claims expressly recite temperature, pressure, and growth rate *ranges* that must be maintained while "growing [the] single crystal diamond." Defendants' proposal does not include a specific growth rate, temperature, or pressure. Consistent with the claims, it only requires maintaining the temperature and pressure within the claimed ranges as long as single crystal diamond is being grown. Defendants' proposal does not suffer from ambiguity or cause confusion; it eliminates the ambiguities inherent in the claims.

#### III. DISPUTED CLAIM TERM IN U.S. PATENT NO. RE41,189

### A. "to improve the optical clarity of CVD diamond"

Contrary to Plaintiffs' reading of the law, see Pls.' Br. at 18, a preamble "[g]enerally is not limiting," Symantec Corp. v. Computer Assocs. Int'l, Inc., 522 F.3d 1279, 1288 (Fed. Cir. 2008) (quoting Catalina Mktg. Int'l v. Coolsavings.com, Inc., 289 F.3d 801, 809 (Fed. Cir.

2002)). This case is no exception. In the context of the '189 Patent, the preamble phrase "to improve the optical clarity of CVD diamond" describes the claimed method's intended use, not the invention. Others before the '189 Patent had improved the optical clarity of CVD diamond. See ECF No. 33-1 at 16 (applicant admitting two prior art references "both improve the optical clarity" of CVD diamond). According to the applicant, what allegedly distinguished the '189 Patent was annealing in the diamond-stable phase and applying the process to *single-crystal* CVD diamond. The claim's preamble provides neither of those features, and the body of the claim defines the structurally complete invention. Thus, the preamble, which merely states a purpose or intended use, is not limiting. See Catalina, 289 F.3d at 808.

Plaintiffs' citations to the patent confirm this. *See* Pls.' Br. at 18. The patent states the purpose of the claimed method is "improving the optical properties of CVD diamonds," one application (among others) being "use[] in jewelry." '189 Patent at 1:52-54, 2:7-9. Despite Plaintiffs' effort to spin it otherwise, the claim refers to improvement in optical clarity exclusively in the preamble precisely *because* it is not a step of the claimed method, only a purpose. *See Catalina*, 289 F.3d at 808 ("In general, a preamble limits the invention if it recites essential *structure or steps*... Conversely, a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state *a purpose or intended use* for the invention." (emphases added)).

Also contrary to Plaintiffs' argument, merely introducing the phrase "CVD diamond" in the preamble does not make improved "optical clarity" limiting. *See* Pls.' Br. at 19. First, the claim's body does not invoke improved "optical clarity," so improved optical clarity does not provide any antecedent basis. Second, the preamble's reference to "CVD diamond" does not specify the crystal type (i.e., single crystal) or the heat treatment parameters that define the

invention. "[T]he preamble has no separate limiting effect if, for example, 'the preamble merely gives a descriptive name to the set of limitations in the body of the claim that completely set forth the invention." *Am. Med. Sys. v. Biolitec, Inc.*, 618 F.3d 1354, 1359 (Fed. Cir. 2010) (quoting *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1434-35 (Fed. Cir. 2000)).

In similar circumstances, many courts—including this one—have found that the preamble language is not limiting. See id. (non-limiting preamble recited "photoselective vaporization of tissue" even though claim's body recited "the tissue"); Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc., 246 F.3d 1368, 1375 (Fed. Cir. 2001) (non-limiting preamble recited "reducing hematologic toxicity in a cancer patient undergoing Taxol treatment" even though claim's body recited "said patient" and "taxol"); Bio-Rad Labs, Inc. v. 10X Genomics, Inc., 396 F. Supp. 3d 368, 381 (D. Del. 2019) (non-limiting preamble recited "conducting a reaction in plugs in a microfluidic system" even though claim's body recited "the microfluidic system" and "the reaction"); ICM Controls Corp. v. Honeywell Int'l, Inc., 256 F. Supp. 3d 173, 192 (N.D.N.Y. 2017) (non-limiting preamble recited "actuating two or more actuator devices from a single microprocessor output" even though claim's body recited "said actuator devices"); 523 IP LLC v. CureMD.Com, 48 F. Supp. 3d 600, 615 (S.D.N.Y. 2014) (non-limiting preamble recited "routing a message from a requestor to a physician through a web site" even though claim's body recited "the requestor," "the physician," and "the web site"); Ride & Show Eng'g, Inc. v. Walt Disney Parks & Resorts, L.L.C., No. 03-6895-GAF, 2005 WL 6220490, at \*4, 9-10 (C.D. Cal. Sept. 23, 2005) (non-limiting preamble recited "patron movement along a multi-dimensional track" even though claim's body recited "the track"). Consistent with these precedents, the disputed preamble phrase "to improve the optical clarity of CVD diamond" is not limiting.

Even if it were, to the extent construction is necessary at all, "to improve the optical clarity" means, in plain English, to make the appearance clearer. *See* '189 Patent at 2:29-32, 4:5-8. Plaintiffs' citations to the patent support this construction because they refer to the diamond "becom[ing] clear" or "turn[ing] clear." *See id.* at 2:32, 4:7. The claims do not recite becoming less opaque, as Plaintiffs propose. Plaintiffs fail to identify any lexicography in the patent providing such a definition. *See Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) ("To act as its own lexicographer, a patentee must "clearly set forth a definition of the disputed claim term" other than its plain and ordinary meaning.").

Improved clarity and decreased opacity are not synonymous. "Clarity" means "[b]rightness, lustre, brilliancy, [or] splendor" and "[c]learness: in various current uses[,]" such as "colour." Ex. I² at 4 (providing the phrase, "[a] cherish'd gem's clarity," as an example usage of the latter definition). "Opacity," on the other hand, has a narrower meaning. It means "being impervious to light" or "not reflecting light." *Id.* at 7. By rewriting improved "optical clarity" as decreased "opacity," Plaintiffs thus seek to limit the claims to a narrow example given in the specification. *See, e.g., Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987 (Fed. Cir. 1988) ("Where a specification does not require a limitation, that limitation should not be read from the specification into the claims."). Plaintiffs also conjure from thin air a specific test for decreased "opacity" by arguing, without support, that persons in the field would evaluate opacity by "comparing the intensity of light entering the diamond with the intensity of light leaving it." Pls.' Br. at 20. Neither the patent nor the law provides any basis for Plaintiffs' position.

The preamble is not limiting. But if the Court disagrees and also decides to construe the term, the PGD/2AT Defendants' construction should be adopted.

<sup>&</sup>lt;sup>2</sup> Exhibit I is attached to the accompanying Declaration of J. Preston Long.

#### IV. SIMILAR DISPUTED CLAIM TERMS IN THE '078 AND '189 PATENTS

### A. "single-crystal diamond" and "single crystal CVD diamond"

The parties agree a diamond may be "single-crystal diamond" or "single crystal CVD diamond" if it has only "a small degree of polycrystallinity localized at the top edges of the diamond." '078 Patent at 13:66-14:1; *see also* Pls.' Br. at 23. But they dispute whether it can have more than that. The PGD/2AT Defendants' proposal properly reflects the claim scope because it precludes substantial non-monocrystalline growth, which would contradict the patent and render the "single crystal" language meaningless. Contrary to Plaintiffs' argument, no law prohibits the use of negative language in a claim construction. *See* Pls.' Br. at 22.

Plaintiffs' phrasing improperly converts "single-crystal" into "substantially single-crystal." In other words, Plaintiffs' construction improperly allows for substantial non-monocrystalline growth. Under their proposal, a diamond can have a substantially single-crystal structure and, at the same time, also have substantial non-monocrystalline growth, which the patent forbids. See '078 Patent at 4:51-54 ("prevent the formation of twins or polycrystalline diamond along the edges of the growth surface"), 5:7-8 (same), 6:51-54 ("prevents the formation of polycrystalline diamond or twins such that a large single crystal diamond can be grown").

Because Plaintiffs' proposal allows for more than "a small degree of polycrystallinity,"
'078 Patent at 13:66-14:1, it should be rejected in favor of the PGD/2AT Defendants' proposal.

### V. CONCLUSION

For the foregoing reasons, the PGD/2AT Defendants respectfully request that the Court enter an order adopting their proposed constructions.

<sup>&</sup>lt;sup>3</sup> Plaintiffs' criticism in that regard is also hypocritical because they use a negative phrase to construe "improv[ing] the optical clarity of CVD diamond" as decreasing opacity. Pls.' Br. at 18.

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## Respectfully submitted,

s/ William P. Deni, Jr.

William P. Deni, Jr. J. Brugh Lower

GIBBONS P.C.

One Pennsylvania Plaza, 37th Floor

New York, NY 10119-3701

Tel: (212) 613-2000 Fax: (212) 290-2018 wdeni@gibbonslaw.com jlower@gibbonslaw.com

Anand K. Sharma (*pro hac vice*)
J. Preston Long (*pro hac vice*)

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP

901 New York Avenue, NW Washington, DC 20001 Tel: (202) 408-4000 Fax: (202) 408-4400 anand.sharma@finnegan.com j.preston.long@finnegan.com

Attorneys for Defendants Pure Grown Diamonds, Inc. and IIA Technologies Pte. Ltd.